REMARKS

This amendment is in response to the Office Action dated December 4, 2002 (the final Office Action). With entry of this amendment, claims 1-6, 12, 14-17, and 36-42 are pending. Claims 1-4, and 12 are amended. Claims 7-11, 13, and 18-35 are cancelled in order to further prosecution. Claims 36-42 are newly presented. No new matter is entered.

Premature Final Rejection

The Office Action mailed December 4, 2002 was indicated as final. The Applicants believe this action improper based on MPEP rules. Specifically, MPEP 706.07(a) states:

> A second or any subsequent action on the merits in any application or patent involved in reexamination proceedings should not be made final if it includes a rejection, on prior art not of record, of any claim amended to include limitations which should reasonably have been expected to be claimed. (Emphasis added)

The present Office Action is a second office action. In the first office action, the Examiner indicated allowability of several claims, including claim 12. The Examiner stated that claim 12 would be allowable if amended to include limitations from the base claim and any intervening claim. In response to the first Office Action, the Applicant complied and amended claim 12 to make it independent in the way suggested by the Examiner. The present final rejection followed, citing the Ueda reference (US 5,986,642) for the first time.

The Ueda reference was not of record in the First Office action, and was only added in the present Office Action. Additionally, the Applicant submits that following the Examiner's suggestion to rewrite claim 12 in independent form is an amendment that "should reasonably have been expected" after the Examiner indicated that doing so would result in an allowable claim. Therefore, both of the above conditions recited in MPEP 706.07(a) are present and the present action should not have been made final.

Further, in the present office action, the Examiner stated that "Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action." The Applicant also respectfully disagrees with the Examiner on this point, because the features added to the claims in the last amendment were present in claim 12 as originally filed. Specifically, claim 12 as originally filed included the feature of: "partitioning the screen into a plurality of sections, and wherein the adjusted reference image is displayed in only one of the sections."

According to MPEP Section 904, "The first search should cover the invention as described and claimed."

Thus, the Applicant's amendment did not necessitate the new search, because the feature that the Examiner indicates is found in the newly cited reference (Ueda) was in the claims as originally filed.

To inform the Applicant that a claim is allowable, then withdraw the allowability in a subsequent Office Action based on newly found art is within the Examiner's authority. Indeed, it is the Examiner's duty to do so, if the Examiner finds an additional reference that anticipates or suggests the claims. However, it is unfair to withdraw the allowability in a *final* Office Action, because otherwise the Applicant does not have a chance to amend the claims or argue the patentability when not under a final rejection. The above MPEP sections recognize this situation, and instruct that when the Examiner applies a newly cited reference to a claim that was amended in an expected manner, the subsequent action should be non-final.

Therefore, the Applicant respectfully requests that the finality of the present Office Action be removed, and this amendment allowed to be entered.

Allowable subject matter

Claims 14-17 were deemed allowable in the first Office Action and are now allowed. The Applicants thank the Examiner for recognizing the patentability of these claims.

Brief discussion of claimed subject matter

Embodiments of the invention are directed to a device and method for compensating for color blindness. Claimed embodiments include a system for displaying images that are adjusted for color blindness. Included in the system is a compensation processor that includes color remappings. As described in the specification, for instance on page 6, the compensation processor includes one or more lookup tables of color remappings. The remappings can also be performed using algorithms. These remappings allow the system to display a color normally associated in a first position of color space as another color. Specifically, the remappings allow the system to display a color that would otherwise have no contrast from other colors to a person who is color blind as a color that does have contrast to such a person.

Claim rejections

Many claims previously rejected by the Examiner have been cancelled. Of those previously rejected claims remaining, claims 1-6, and 12 were rejected as being anticipated by Yui (U.S. Pat. No. 5,677,741) in view of Ueda et al (US 5,986,642). Yui is the main reference. The Examiner uses Ueda to teach simultaneous display of an original signal and an adjusted signal.

Yui's teachings relate to color changing processes for particular users. Specifically, every user who "turns on a custom registration button" generates his or her own "custom table data." Yui, Column 3, lines 58-62. As illustrated in FIG. 1 of Yui, the users' custom tables are stored in custom table memory 9. Once created in Yui, each custom table is related to an individual user ID. When a user who has a custom table pre-loaded in the Custom Table Memory 9 inputs personal ID information, Yui's system automatically uses the table in the custom table memory specific for that user to generate video signals.

Oftentimes, however, users do not know how to adjust color signals, or do not want to take the time to experiment with adjusting the color controls. Unlike Yui's system, embodiments of the invention actually make it easy for a user to select a video signal that is more useful to them than the original video signal. One of the ways that embodiments of the invention do this is to provide the user with only pre-defined remappings that were specifically tailored for different types of color blindness. In this way, the user selects the best of a group of images pre-formatted to be the most likely to benefit the user, i.e., the remapping table is already pre-loaded with remappings for the most common types of color blindness. Therefore, the user need not experiment with a multitude of different settings to create images in which they can differentiate colors.

These differences are seen in the claims as well. For instance, claim 1 includes a compensation processor that has a plurality of separate color point remappings that are non-modifiable by a user of the video system. This is neither anticipated nor suggested by Yui, which forces his users to modify the color levels. Indeed, Yui actually teaches away from the invention by giving the user more control over their image systems. Embodiments of the invention, conversely, give the user less control, but hopefully the pre-defined remappings will be easier to use and ultimately provide an easier way for the user to select a video signal that is more beneficial to a color blind user. The teachings of Ueda do not make up for the limitations of Yui. Claim 12 is likewise not anticipated or suggested by Yui and/or Ueda, because the transform is "non-modifiable by a user of the display.

Newly added claims 36-42 are directed to similar subject matter as already allowed claims 14-17. Specifically, the claims define how to make a color blindness compensating remapping table. As the Examiner noted in the first Office Action, these features are not taught or suggested in the prior art.

Conclusion

For the foregoing reasons, reconsideration and allowance of claims 1-6, 12, 14-17, and 36-42 of the application as amended is solicited. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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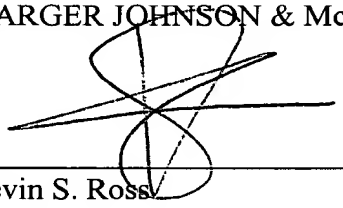

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Christina Vaughn

VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) A real time video system for outputting to a screen signals for displaying color images that are adjusted for color blindness from original color images encoded in a real time video signal, the video system comprising:

a decoder for decoding the video signal into at least one original color signal associated with a color of the original image;

a compensation processor coupled with the decoder for receiving the original color signal, [and for generating an adjusted color signal from] the compensation processor including a plurality of separate color point remappings that are non-modifiable by a user of the video system, the compensation processor structured to remap the original color signal into one or more color blind compensated signals by remapping color points from the original color signal, for compensating for at least a first type of color blindness; and

display circuitry structured to cause the screen to display the original color signal and the [adjusted color signal] one or more color blind compensated signals simultaneously.

2. (Amended) The system of claim 1, wherein the compensation processor is structured to generate two [adjusted color] color blind compensated signals for compensating for the first and a second type of color blindness, and further comprising means for selecting to output one of the first and the second adjusted color signals.

3. (Amended) The system of claim 1, wherein the original color signal is associated with a series of ordered sets of original samples, and wherein the [adjusted color signal] each of the color blind compensated color signals is associated with a series of ordered sets of samples adjusted from the original samples according to a first color gamut adjustment predefined for the first type of color blindness.

4. (Amended) The system of claim 3, wherein the original samples represent original values, each original value associated with a content of a respective one of a plurality of predefined primary colors, the [adjusted] color blind compensated samples represent adjusted values, each adjusted value associated with a content of a respective one of the primary colors, and wherein the system further comprises a memory coupled with the processor and having stored therein the sets of original values and the first set of adjusted values.

5. The system of claim 4, further comprising means for combining the original samples of a single ordered set thereby generating a single sample for inputting into the memory as an address.

6. The system of claim 4, wherein the memory reads out a single sample for each input ordered set of original samples, and further comprising means for extracting from the sample output by the memory an ordered set of adjusted samples.

7. 7-11 (Cancelled)

12. (Amended) A method for adjusting real time color images encoded in a video signal suitable for producing a display on a screen comprising:

decoding the video signal into at least one original color signal associated with a color of the original image;

using a reference color image to generate at least one reference color signal associated with a color of the reference image;

generating an adjusted signal from the reference color signal according to a tested transform associated with a tested type of color blindness, the transform non-modifiable by a user of the display;

applying the adjusted signal to the screen, the screen thereby displaying color images adjusted for the first type of color blindness;

partitioning the screen into a plurality of sections, wherein the adjusted reference image is displayed in only one of the sections;

accepting an input from a viewer as to whether the adjusted reference image is desirable; and

if the adjusted reference image is desirable, using the tested transform as the first transform.

13. (Cancelled)

14. A method for adjusting real time color images encoded in a video signal suitable for producing a display on a screen comprising:

decoding the video signal into at least one original color signal associated with a color of the original image;

digitizing the original color signal to produce at least one original value;

generating an adjusted signal from the original color signal according to a first transform associated with a first type of color blindness by looking up in a memory an adjusted value corresponding to the original value;

applying the adjusted signal to the screen, the screen thereby displaying color images adjusted for the first type of color blindness;

selecting a set of coordinates for defining a color space;

selecting a type of color blindness;

characterizing the selected type of color blindness with respect to the coordinates as at least one discernible region in the color space;

selecting a color gamut adjustment that maps at least one region outside the discernible region into the discernible region;

generating the original values and the adjusted values that perform the color gamut adjustment; and

storing the original values and the adjusted values in a look up table in the memory.

15. The method of claim 14, wherein the memory is an EPROM, and wherein storing is performed by burning in the EPROM.

16. The method of claim 14, wherein selecting includes contracting a portion of the discernible region.

17. The method of claim 14, wherein selecting includes rotating at least a portion of one of the regions.

18- 35 (Cancelled)

36. (New) The video system of claim 1 wherein the compensation processor is structured to remap color points from the original signal by using a color lookup table.

37. (New) The video system of claim 1 wherein the compensation processor is structured to remap color points from the original signal by using a color transformation algorithm.

38. (New) A method for generating a color blindness compensating remapping table, comprising:

selecting a set of coordinates for defining a reference color space;

selecting a type of color blindness;

relating the selected type of color blindness to the coordinates of the reference color space to define a discernable region for the selected type of color blindness;

selecting a color gamut adjustment that maps at least one location in the reference color space that is outside the discernible region into the discernible region;

generating original values identifying locations within the reference color space;

generated shift values from the original values based on the color gamut adjustment;

relating the original values to the shift values; and

storing the original values and the shift values in a look up table in the remapping table.

39. (New) The method of claim 38, wherein the remapping table is embodied in an EPROM, and wherein storing is performed by burning data in the EPROM.

40. (New) The method of claim 38, wherein the selected type of color blindness is deuteranope.

41. (New) The method of claim 38, wherein selecting includes rotating related locations in the reference color space relative to the reference color space coordinates.

42. (New) The method of claim 38, further comprising:

selecting a second type of color blindness;

relating the second type of color blindness to the coordinates of the reference color space to define a second discernable region;

selecting a color gamut adjustment that maps at least one location in the reference color space that is outside the second discernible region into the second discernible region;

generated a second set of shift values from the original values based on the color gamut adjustment;

relating the original values to the second set of shift values; and

storing the second set of shift values in a second look up table in the remapping table.